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ABSTRACT

This model instructional system, developed for the office cluster of business occupations but having relevance for other curricula, is an approach to "modernizing" office education. Since there was a need for immediate job relevance of instruction and an integrated career progression, the instructional system is designed to be career- and performance-oriented, with self-pacing and individualized instruction, having immediate and detailed feedback to students and system managers. Through a systematic use of peer instruction in job simulation, the need for additional teachers and instructional materials is eliminated; peer instruction is also a low-risk, high-return instructional medium. Quality control in using the peer-instructional system is the responsibility of the qualified teacher. Establishment of flexible managerial capabilities within the system allows for efficient use of facilities and equipment, and precludes the need for additional expenditures in this direction. In addition, this flexibility provides ease of management in adjusting the system to accommodate increases or decreases in student population and in the type and depth of curriculum. A flow chart of the system is provided. (TA)

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A Career-Oriented, Free-Flow, Peer-Instructional System

Jacklyn E. Hungerland

U S DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

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16. Abstracts

This paper presents a description of a performance-oriented, self-paced, free-flow, peer-instructional, career-progression instructional system. The model system was developed for the office cluster of business occupations, but has relevance for other curricula. Incorporated in the model are definitive measures for quality control and accountability.

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Prefatory Note

This paper contains the essence of a presentation to the statewide administrative staff of the California Bureau of Business Education at Los Angeles, California on January 5, 1972. Mrs. Hungerland is a Research Associate with the Human Resources Research Organization Division No. 3, Monterey, California. The research reported was conducted under Project OFFICE-ED, Research to Develop a Model Instructional Program in the Office Cluster of Business Occupations. It is described in more detail in HumRRO Technical Report 72-28, *Development and Pilot Test of a Career-Oriented, Peer-Instructional Model in the Office Cluster of Business Occupations*, by Jacklyn E. Hungerland, Eugene R. Michaels, and John E. Taylor, October 1972.

A CAREER-ORIENTED, FREE-FLOW, PEER-INSTRUCTIONAL SYSTEM

Jacklyn E. Hungerland

BACKGROUND

With the job market expanding significantly for individuals skilled in the office occupations, leaders in the business area of vocational education are implementing or incorporating some of the dramatic advances in instructional technology developed within the past decade. One of these advances focuses on performance-oriented training in situations where job-relevance of instruction is vital. The California Bureau of Business Education has had a keen interest in introducing performance-oriented instructional programs, particularly in the area of office education, where, traditionally, instruction has been basically tied to a classroom, subject-oriented model.

Based upon this need, a project for "Research to Develop a Model Instructional Program in the Office Cluster of Business Occupations" was established by the California State Department of Education. The project was monitored by the California Research Coordinating Unit, and was funded through the Unified School District of Pacific Grove, California, with HumRRO (Human Resources Research Organization) serving as operative subcontractor. The specific goals of the project were to (a) construct an instructional model to include plans for establishing a synthetic job-instructional business office and adjunct skill center; and (b) provide a detailed plan for implementing the model, including cost estimates relating to facilities, equipment, and personnel, and procedures for monitoring the implementation and for evaluating the outcome.

In addition to these prime goals, it was felt that it would be appropriate and desirable to develop the instructional system with a career orientation. For this purpose, information from the Bureau of Business Education (BBE) was augmented with information from the Department of Transportation (DOT) and the U.S. Office of Education (USOE) to constitute a career ladder for the office occupation cluster to be incorporated as part of the basic structure of the instructional system.

TECHNOLOGICAL FOUNDATIONS FOR CONSTRUCTING AN APPROPRIATE MODEL

HumRRO has generally taken a systems approach in developing instructional programs. In this approach, several procedures are established and parameters are considered that integrate into the total instructional system—task analyses are conducted, behavioral objectives determined, performance criteria established, and cost and time constraints considered.

The instructional principles on which the office education model was to be based were performance orientation and job relevance of instruction; insistence on skill mastery; immediate and detailed feedback to students, instructors, and system managers; and individualized instruction through self-pacing. In addition, to provide a criterion-based approach to accountability, stringent quality control mechanisms were to be built into the system.

The project proposed to integrate "on-the-job" training with instruction in a skill center for developing enabling knowledge and skills. To satisfy the need for additional "teachers," in support of the self-pacing principle, peer instruction was adopted as the instructional mode to be emphasized in the on-the-job phase. Self-instructional materials (already available) were to be used in the skill center. If the system is to be truly self-paced for students in the career progression, management techniques would have to be designed to permit a free flow of students through the system without placing a strain on any other part of the system. To accommodate these requirements, a role was established within the system that would allow expansion and contraction of the system in such a way that the flow and function of the system may be maintained. This role is referred to as the "job surrogate," and its exact functioning is explained in a later section. In addition, the system has been designed so that curriculum can be added or subtracted as necessary to meet the needs and demands of the student population and the job market.

A formally constituted, systematic use of peer instruction has been made and tested in another instructional model that was based upon the same instructional principles stated above.[1] The tested model was proved to provide an economically feasible program of individualized instruction in which achievement is high, even for slower learners, and motivation and self-esteem are enhanced.[2] The use of these tested technologies in the office education instructional model would, therefore, provide a sound foundation on which to build a model specifically appropriate to the needs and requirements of the office cluster.

SURVEY OF LITERATURE AND OF EXISTING OFFICE SIMULATION PROGRAMS

In pursuit of the project's Phase I goal (to identify functional job sub-clusters in the office occupations), a survey of the relevant literature was conducted, with particular attention given to the publications of project NOBELS and various state-funded projects (e.g., Visalia and San Mateo). In addition, visits were made to several existing office simulation programs, since the on-the-job phase of the instructional system was to be conducted in a synthetic office setting.

The results of these surveys, combined with the goals of the project and the soundly based technologies mentioned, led to the conceptualization of a career-oriented, peer-instructional system for office education.

THE CAREER-ORIENTED, PEER-INSTRUCTIONAL SYSTEM

As determined by the Phase I survey, there are two features of the standard approach to business office simulation that appear to be characteristic:

(1) The simulation is used as the terminal experience in the training program.
(2) The jobs within the simulation are interdependent, the effective functioning of the "office" being dependent on the constant operation of all of its parts.

[1] Weingarten, Kenneth, Hungerland, Jacklyn, Brennan, Mark, and Allred, Brent. *The Development of a Low-Cost Performance-Oriented Training Model*, Paper for Symposium presentation at the American Psychological Association Convention, Miami Beach, Florida, September 1970; issued as HumRRO Professional Paper 32-70, December 1970.

[2] Weingarten, Kenneth, Hungerland, Jacklyn E, and Brennan, Mark F. *Development and Implementation of a Quality-Assured, Peer-Instructional Model*, HumRRO Technical Report 72-35, November 1972.

This type of simulation is neither a vehicle nor a stimulus for skill acquisition. At best, it helps to integrate fragmented components in a somewhat realistic setting. In its terminal position in the training program, the simulation requires staffing by people who come to it with all skills previously acquired. In some cases, these skills may have been acquired originally one, two, or three years prior to entry into the simulated office. If there has been too little intermediate practice, some of these skills may have become very rusty, and the student may spend most of this time in the "office" regaining confidence and skill competencies.

The tendency toward adoption of this approach in standard simulation seems to have resulted from considerations of expediency rather than concern with optimal conditions for learning. Under these circumstances, the potential value of the simulated office as a functional context for learning is diminished to the point where its practicality and utility are questionable.

Job Surrogate

Clearly, it is essential that the job or the office experience be the *initial* and continuing experience throughout the training program. In addition, because of practical complications involved with variable student flow and variable skill levels among students, it appears that jobs within the office simulation should be independent of each other without sacrificing verisimilitude. Rather than each job being dependent upon another job in order to maintain work flow, work can be generated for each job from a centralized position where one or more persons (teachers or students who are advanced enough in the program to take over management functions) can serve to coordinate work flow through the job stations, when such intervention is necessary. This function is called the job surrogate. The use of such a surrogate provides the necessary flexibility in the number and kind of jobs to be offered, and precludes the managerial problems that would be encountered with a free-flow of students in a job-interdependent system.

An additional advantage of utilizing a job surrogate is that it provides the flexibility to customize the curriculum to meet students' specific demands. For example, if a student has reached the stenographic job level in the system and expresses an interest in becoming a legal stenographer, legal-specific instructional materials and job tasks can be provided with very little effort and the job surrogate would provide the necessary work flow into the legal-stenographic position and would receive outputs from that position (thereby substituting realistically for the lawyer "boss").

The action of the correlative will be somewhat like that of an accordion—its function will expand and contract in direct relationship to the number and kinds of job stations that are operational. For example, should the student population and capabilities allow for all types of jobs to be filled, and these jobs are all operating, the function of the surrogate will contract to zero for job inputs and the work-flow will be directly between and among jobs. Some job *outputs* would, however, be received by the surrogate when there is no authority or "receiver" higher than the job from which the material is generated.[3] In such a case, some of the system interactions might look like Figure 1. If, in this scheme, there is no Executive Secretary job station operating, then the surrogate would take over the functions of that station and these particular system interactions would look like Figure 2.

In general terms, this approach allows for developmental flexibility to a degree that is unattainable in a fixed simulation program featuring job interdependence, where a change in any job would necessarily entail change in all related jobs. In addition, the use of a surrogate approach allows for utilization beyond the office cluster, giving relatively limitless capability.

[3] The surrogate will always function as a monitor of the system—it is only the degree to which the surrogate takes active part in the work-flow that will fluctuate.

Work Flow of Synthetic Office:
Minimal Surrogate Function in System Interaction

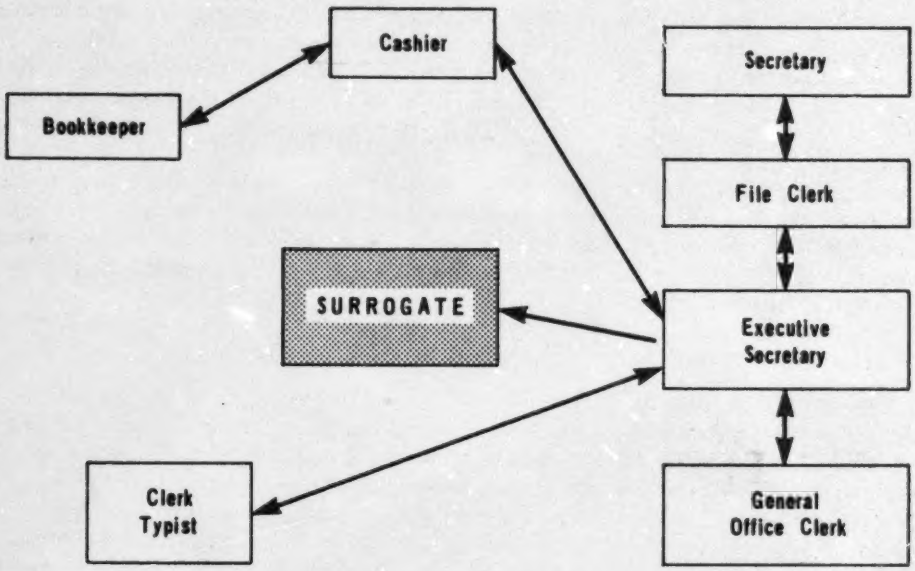


Figure 1

Work Flow of Synthetic Office:
Expanded Surrogate Function in System Interaction

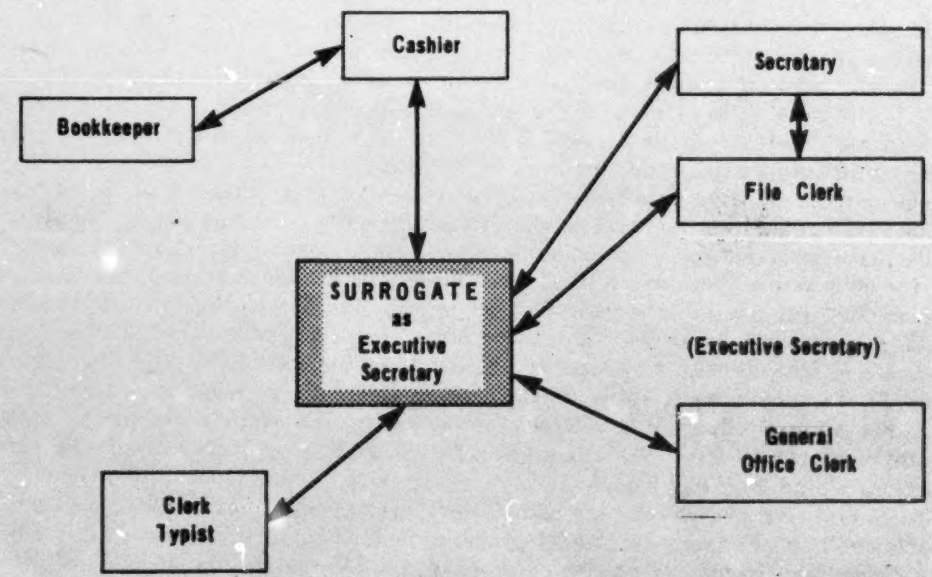


Figure 2

Job Simulation

What will be set up, then, is *job* simulation rather than *office* simulation, even though the job simulation will be established in an office-like setting. In fact, we will be creating a "World-of-Work" program, incorporating a skill center, job simulation, work experience, job acquisition techniques, and on-the-job behaviors and interpersonal skills; and, at the same time, the system will permit an unusual degree of customization.

The career-oriented hierarchy that has been identified and that will be simulated is (from lowest to highest):

Duplicating Machine Operator
File Clerk (three levels)
General Office Clerk (two levels)
Cashier
Receptionist (two levels)
Typist
Clerk Typist
Bookkeeper (three levels)
Stenographer
Secretary
Executive Secretary

Also included is some training, or at least experience, for more advanced students in supervising, planning, and management.

There are four levels of "job aspirants" in the Pacific Grove High School—9th to 12th graders—as well as two full-time teachers and one, half-time teacher. There are instructional materials and equipment available for the skill center, which have been used successfully, therefore requiring little or no change in instructional content *per se*. These materials include practice books and self-instructional texts that allow the student to work individually.

FLOW WITHIN THE SYSTEM

One way in which the available resources might be used to the best advantage and to meet our objectives is through a modular approach. Each module would represent a job station (see Figure 3). The progression through each module would be as follows:

(1) Student enters system.
(2) Goes to "Employment Service."
(3) Surveys list and description of available jobs.
(4) Completes application form for job he wishes to do.
(5) Gets appointment for interview.
(6) Teacher (or later perhaps an advanced student) interviews applicant.
    (a) Gives appropriate skill test(s).
    (b) Determines applicant's interests and aspirations (through interview).
(7) On the basis of test results and interview, the student is "hired" for an appropriate job—a job for which the student is prepared through previously acquired skills. When hired into the job, the student becomes the "job performer." Students at different grade levels will probably have progressively greater capabilities, so that a 12th grader might conceivably fill a stenographer's position while an entering 9th grader might be able to fill only a duplicating machine operator's job. Job performers will be required to be on the job for specified "office hours," so that they will be available for teaching "new hires" or "trainees." At the same time, when their office hours are over, they would be free to go to another, advanced job for orientation or instruction, to the skill center, or out into the work experience program.

Free-Flow Peer-Instructional System

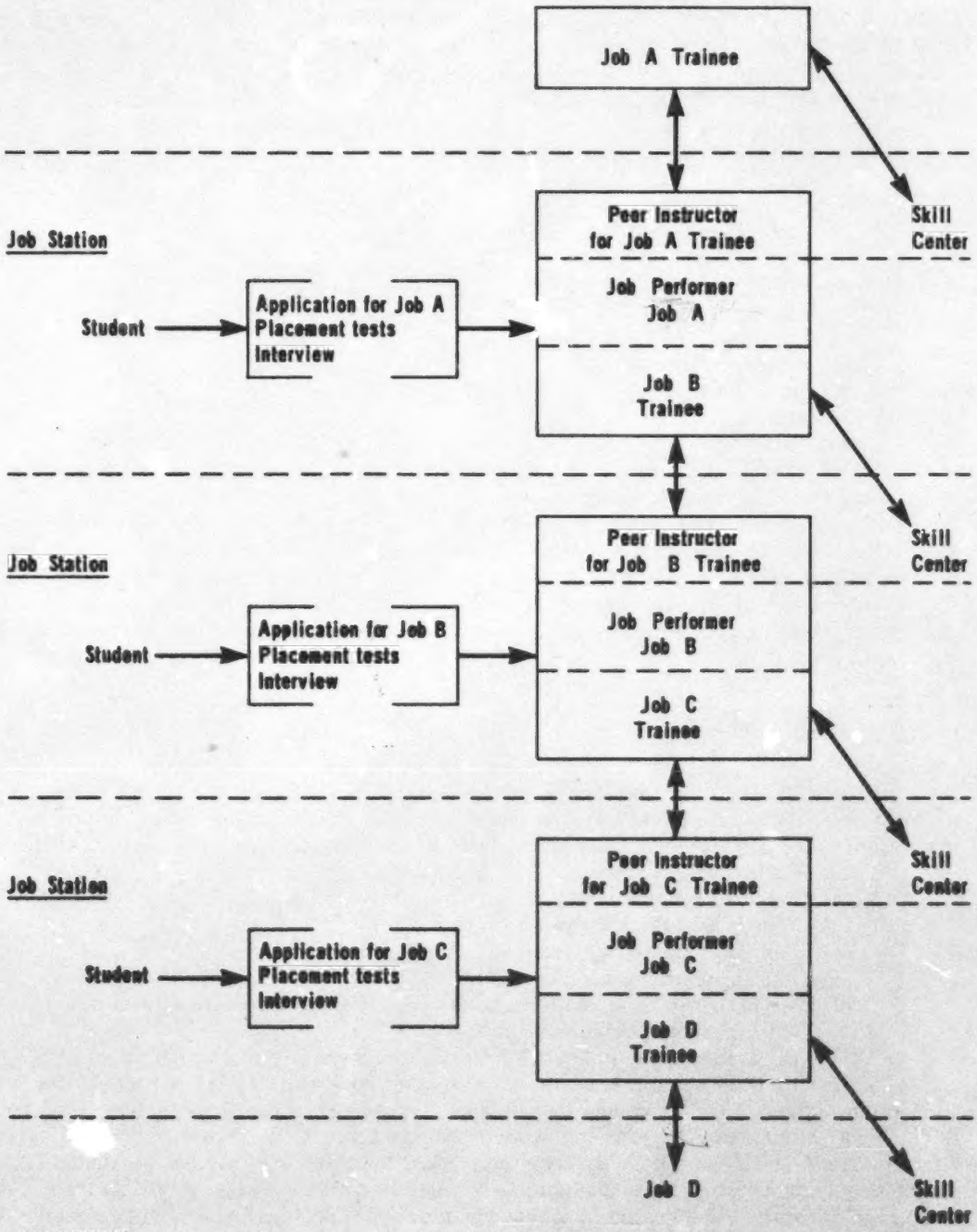


Figure 3

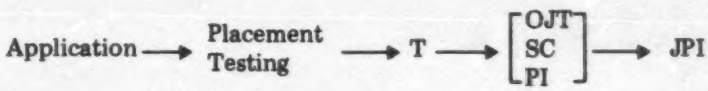
(8) When the trainee student has mastered all the skills for a given job, he will be hired into that job as a job performer.

(9) Any job performer may re-apply to the Employment Service at any time that he feels he has acquired the requisite skills for another, more advanced job. Steps 2 through 7 would then be repeated for each new job assignment the student might receive.

It is difficult to imagine that a 9th grader just entering the curriculum can make a meaningful choice in favor of an office career without further information—what jobs are available, what job duties are, whether or not he is interested, and so forth. To answer some of these questions, very shortly after the beginning of each term, jobs will be filled and the incoming student can observe all jobs in operation, thereby getting an idea of where the road leads. There will probably be some students who are interested only in learning typing. Despite the limitations of their aspirations, these students will be brought into the system and "hired" as part-time clerks to learn the skills adjunctive to simply typing "X" words per minute, for example, changing of ribbon, cleaning and care of machine, and use of different reproduction mats. Should students wish to acquire only some basic office skills, they will still leave this program with job competencies. Even the "typing only" students will have been taught in a functional context with job relevancy.

When a student is "hired" for a job, he becomes a job performer. He also becomes an instructor for any trainee assigned to him. Therefore, this student is called a job performer/instructor (JPI). At the same time, he himself may be assigned as a trainee in a job opportunity progression. He will acquire the skills for the new job in his time outside of his "office hours." If no trainee is available, the JPI student can still be a job performer, getting practice in and maintaining mastery level of the job skills. The system also assumes the student's command of all jobs previously held. If the need arises, a given student may be required to give instruction to a trainee in a job the student has already vacated. A graduate of the program should be competent in all job skills, not merely those in his terminal assignment.

The role of the student may, therefore, be dichotomous—while he is a job performer/instructor in one job, he may be a trainee in a more advanced job. The flow for each job for each student will be as follows:



If the student enters the system as a relatively unskilled trainee (T), he is the recipient of instruction via the skill center (SC), and the on-the-job training (OJT) provided is peer-instruction (PI) by the job performer/instructor (JPI). When he masters the required skills, he is cycled into the job as the JPI and instructs another trainee. Most students, however, will enter the system with some job skill capability and will be "hired" initially as JPIs. Their procedure will then be to follow the flow chart, applying for a succession of jobs progressively higher up on the career ladder.

The system, seen as a whole, would be made up of several such job stations, operating simultaneously. As the interests and needs of the students fluctuate, the number and kind of job stations will vary to meet the demand. One semester there may be several clerk-typist positions and only a few secretarial or stenographic positions. If the demand for training secretarial personnel exceeds the supply of secretarial job performers, trainees can double-up and receive simultaneous OJT from one JPI. The greater danger is that there will be no trainee for the job performer/instructor to instruct. In this system, added practice will be substituted for the act of instruction. While added practice probably does not have the augmenting quality of the instructional experience, it does have merits as a vehicle for "cementing" newly acquired skills.

Role of the Teacher and Quality Control

The teachers in this system will have multiple functions:

(1) They will act as the "Employment Service" and job opportunity managers for the placement and advancement of students.

(2) They will act as the agents for accountability, exercising quality control through:

(a) The administration of mastery tests for skills learned either on the job or in the skill center.

(b) The administration of aptitude tests to job applicants.

(3) They will act as the job correlative.

The built-in mechanism for controlling quality is the job application procedure. When an applicant is interviewed for "hire," his performance on the job skills is measured by aptitude tests. In this way, as students move on to new jobs, they are automatically tested. If they have not truly mastered the job skills, they will not be eligible for the job—they will have to return to the skill center or the OJT and work until they *have* mastered the necessary skills.

Equipment and Facilities

No additional equipment need is anticipated. Demands on equipment use are met by staggering the "office hours" so that equipment is available for the skill center practice use. It should be noted that the "skill center" is not necessarily to be established as a distinct entity or physical location—"skill center" activities may take place at the OJT site or wherever appropriate.

The three classrooms that are available will need only minor rearrangement to set up the required job stations. No additional facilities are required at this locale.

Job Packets

For each level of the jobs identified on the career ladder, job packets will be supplied that will enable a teacher to set up the job station with complete understanding of the nature and objectives of the job, how to set up the job station, and what the work flow of the job requires. Each packet will contain the following items:

(1) *Master matrix*, showing the situation of the job in the career ladder and the skill areas required to perform that job.

(2) *Sub-matrices*, one for each skill area required; each matrix indicating the specific skills required in each skill area.

(3) *Task analysis*, listing the tasks comprising the job.

(4) *Behavioral objectives*, including conditions and standards under which the job must be performed.

(5) *Job description*, a "recruitment" type of document stating, for the benefit of the potential job applicant/student, the nature of the job and any prerequisites.

(6) *Performance tests*, procedural step checklists for the performance of the job tasks.

(7) *Instructor's guide*, brief memory aids listing the tasks that must be taught to the trainee.

(8) *Supervisor's guide*, describing the job station setup, work flow, and correlative functions (for use when necessary).

(9) *Materials list*, detailing the job station setup, work flow, and correlative (documents to file, dictation to transcribe, etc.).

(10) *Equipment requirements*

(11) *Job placement tests*, for use in the student's job application process.
(12) *Flow chart*, indicating the nature of job inputs and outputs in relation to other job stations.

REVIEW OF THE CONCEPT

Based upon our experience in the development of proven instructional systems, we were able to outline some assumptions and some constraints in our approach to "modernizing" office education.

The need for immediate job relevance of instruction was most apparent, as was the need for an integrated career progression. The appropriateness of applying tested learning principles was beyond doubt—the instructional system must be performance-oriented, with self-pacing and individualized instruction, and there must be immediate and detailed feedback to students and system managers.

Since cost constraints are always present, we elected to utilize the most plentiful instructional resource available—the students themselves. Peer instruction was found to be a low-risk, high-return instructional medium. Through a *systematic* use of peer instruction, the need for additional teachers and instructional materials is eliminated. For the sake of accountability and quality maintenance, a fixed criterion is established—every student must achieve the performance standards established for the tasks undertaken on his job. Control of this quality standard is in the hands of the qualified, certificated teacher.

Establishment of flexible managerial capabilities within the system allows for efficient use of facilities and equipment, and precludes the need for additional expenditures in this direction. In addition, this flexibility allows for ease of management in adjusting the system to accommodate increases or decreases in student population and in type and depth of curriculum.

While the instructional system was designed and pilot-tested in the context of Pacific Grove High School, the system is not specifically tailored to that school. It is designed as a generalizable model that may be used in any location and may be used in curricula other than office education.

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